

CLOSED CELL TRENCH METAL-OXIDE-SEMICONDUCTOR FIELD EFFECT TRANSISTOR

ABSTRACT OF THE DISCLOSURE

5 Embodiments of the present invention provide an improved closed cell trench metal-oxide-semiconductor field effect transistor (TMOSFET). The closed cell TMOSFET comprises a drain, a body region disposed above the drain region, a gate region disposed in the body region, a gate insulator region, a plurality of source regions disposed at the surface of the body region proximate to the periphery of the gate insulator
10 region. A first portion of the gate region and the gate oxide region are formed as parallel elongated structures. A second portion of the gate region and the oxide region are formed as normal-to-parallel elongated structures. A portion of the gate and drain overlap region are selectively blocked by the body region, resulting in lower overall gate to drain capacitance.